

CALIFORNIA ENERGY COMMISSION

1516 Ninth Street, MS-29
Sacramento, California 95814

Web Site: www.energy.ca.gov



January 22, 1999

Members of the Senate Energy, Utilities and Communications Committee
Members of the Senate Budget and Fiscal Review Committee
Members of the Senate Appropriations Committee
Members of the Assembly Utilities and Commerce Committee
Members of the Assembly Budget Committee
Members of the Assembly Appropriations Committee
California State Capitol Building
Sacramento, California 95814

**Re: California Energy Commission's Quarterly Report
Concerning the Public Interest Energy Research Program**

Dear Members:

In accordance with Public Resources Code Section 25620.5(h), the California Energy Commission hereby transmits its Quarterly Report for the Public Interest Energy Research (PIER) Program, for the period October 1 through December 31, 1998. The attached report provides the required "evaluation of the progress and a status of the [PIER Program's] implementation" for this quarter. It also provides preliminary input for the Energy Commission's more detailed PIER Program Annual Report required pursuant to PRC Section 25620.8 which, in turn, will provide project-specific information and recommendations for program improvement. The 1998 Annual PIER Report will be submitted during the first quarter of 1999.

As reflected in the attached Quarterly Report, the Energy Commission has made substantial progress in implementing the PIER Program to date. California's success with the PIER Program serves as a model for other states and has become a focal point for the Energy Commission/Department of Energy Memorandum of Understanding. Both New York State Energy Research Development Authority and the Association of State Energy Research and Technical Institute are pursuing similar avenues. Should you have questions or comments concerning this report, please feel free to contact Traci Stevens, Energy Commission Director of Governmental Affairs, at 654-4942.

Respectfully submitted,

DAVID A. ROHY, Ph.D.

Vice Chair and Presiding Member
of the RD&D Committee

cc: California Legislative Analyst Office

ROBERT A. LAURIE

Commissioner and Associate Member
of the RD&D Committee

**California Energy Commission's Quarterly Report
Concerning the Public Interest Energy Research Program
(Fourth Quarter: October 1 through December 31, 1998)**



California Energy Commission
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1516 9th Street, MS-30
Sacramento, California 95814
(916) 654-4942

California Energy Commission's Quarterly Report Concerning the Public Interest Energy Research Program (October 1 through December 31, 1998)

In accordance with Public Resources Code (PRC) Section 25620.5(h), this document hereby constitutes the California Energy Commission's Quarterly Report for the Public Interest Energy Research (PIER) Program covering the period from October 1 through December 31, 1998. This report provides the required "evaluation of the progress and a status of the PIER Program's implementation" for this past quarter. It also provides input for the Energy Commission's more detailed PIER Program Annual Report, required pursuant to PRC Section 25620.8 which, in turn, will provide project-specific information and recommendations for program improvement. The 1998 Annual PIER Report will be submitted during the first quarter of 1999.

Overview of the PIER Program

In accordance with the provisions of Statutes 1997, Chapter 905 (SB 90), the primary mission of the PIER Program is to "improve the quality of life of this state's citizens...[by funding] public interest energy research, development and demonstration [RD&D] projects that are not adequately provided for by competitive and regulated energy markets." The funds for this program come from the electricity ratepayers of specified investor-owned utilities and are held in the PIER Program's Trust Fund Account.

The Energy Commission has fully encumbered all funds authorized for Fiscal Year (FY) 1997/98 through RD&D awards made pursuant to two separate PIER Program competitive solicitations, the Transition Solicitation and the First General Solicitation, completed during the January through June period of 1998.

For FY 1998/99, the Legislature has authorized the Energy Commission to encumber up to \$61.8 million through the PIER Program for public interest RD&D projects. In the fourth quarter of calendar year 1998, the Energy Commission specifically encumbered \$13.6 million of the FY 1998/99 PIER Program funds through its Second General PIER Program competitive solicitation. The total funds encumbered to date for FY 1998/99 are approximately \$28.7 million.

During the fourth quarter of 1998 the Energy Commission made significant progress in developing plans for funding six key PIER program areas in 1999, and the Energy Commission also designated an outstanding panel of experts to conduct an independent evaluation of the PIER program, as required in Public Resources Code Section 25620.9(a). During this past quarter, opportunity for public input regarding the PIER Program was provided through three separate Energy Commission hearings.

Further details concerning the activities for this past quarter are provided below.

Transition Funding Solicitation

In 1998, the Energy Commission awarded approximately \$17 million to 39 separate "transition" RD&D projects covering the five PIER Program subject areas of renewable generation, environmentally preferred

advanced generation, end-use energy efficiency, energy-related environmental research, and strategic energy research. These one year funding awards, which are being funded partially with FY 1997/98 authorizations and partially with FY 1998/99 authorizations, are expected to preserve the benefits of the most promising ongoing public interest RD&D efforts conducted by investor-owned utilities, under California Public Utilities Commission's oversight, prior to the onset of electric industry restructuring.

During the fourth quarter of 1998, significant progress was made on most of the transition projects; however, the Commission's Research, Development, and Demonstration Committee (RD&D Committee) did request that the funding for one project (the ETS Dish/Stirling project) be withdrawn because that project could not be properly completed, as required, during the transition period. Active management of the remaining 38 transition projects is ongoing, and the Commission anticipates that several of these projects will be completed during the first quarter of 1999. Most of the remaining transition research projects are scheduled for completion by the third quarter of 1999.

First General Solicitation

A key objective of the PIER Program is to develop energy products or services that will be applied in the emerging, restructured energy marketplace and that will produce benefits for California's electricity ratepayers. Accordingly, in February 1998, the Energy Commission released its First General Solicitation for three of the five PIER Program subject areas in SB 90, namely renewable generation, environmentally preferred advanced generation, and energy-related environmental research.

In response to this solicitation, on March 30, 1998, the Energy Commission received 180 proposals that requested approximately \$150 million in PIER funds in response to this solicitation. The Energy Commission publicly reviewed the results of this evaluation effort on June 24, 1998, and awarded approximately \$18.3 million in funding to the 20 most meritorious RD&D proposals. The \$18.3 million in PIER Program funds will be leveraged with more than \$48 million in other cash and in-kind matching funds, thus providing more than \$66 million in total funding for public interest energy RD&D through this solicitation.

During the fourth quarter of 1998, the Energy Commission finalized contracts and initiated work on the most of the 20 projects that received awards pursuant to the First General Solicitation. Currently, 15 of the 20 projects have fully signed and/or approved contracts. The awards are distributed over the three specified subject areas as follows:

- (1) ***Renewable Generation Research*** (\$6.5 million was awarded to ten renewable generation projects);
- (2) ***Environmentally-Preferred Advanced Generation Research*** (\$6.1 million was awarded to seven environmentally-preferred advanced generation projects); and
- (3) ***Environmental Research*** (\$5.7 million was awarded to three energy-related environmental research projects).

The Energy Commission found that these projects were well-balanced across subject areas and technologies and is pleased to note that 12 of the 20 selected projects will be conducted by small

businesses. Detailed information regarding all 20 projects will be provided in the PIER Program Annual Report, which will be completed in early 1999.

Second General Solicitation

On April 10, 1998, the Energy Commission released its Second General Solicitation for public interest RD&D projects covering the remaining two SB 90 subject areas of end-use energy efficiency and strategic energy research. The focus of the Second General Solicitation was to address end-use efficiency and strategic energy research issues that would help California's electricity ratepayers benefit from the newly deregulated electricity market. On June 1, 1998, the Energy Commission received 169 proposals seeking \$126 million in PIER Program funds in response to the Second General Solicitation, with 93 in the end-use energy efficiency area and 76 in the strategic energy research area. A Notice of Proposed Awards issued by the RD&D Committee recommended that \$6.8 million be awarded to 14 end-use energy efficiency projects and \$6.8 million awarded to 10 strategic energy research projects.

At its publicly noticed Business Meeting on October 14, 1998, the Energy Commission considered and approved \$13.6 million in awards for the Second General PIER Solicitation. Also during the fourth quarter, the Energy Commission began preparing contracts for the 24 projects that received these awards. The Energy Commission found that these projects were well balanced across subject areas and technologies, and the staff of the Energy Commission is pleased to note that 14 of the 24 selected projects will be conducted by small businesses. Additional information regarding these 24 projects will be provided in the PIER Program Annual Report, which will be completed in early 1999.

Energy Innovations Small Grants Program

In 1998, the Energy Commission initiated an "Energy Innovations Small Grants" program which will provide PIER Program funding support to help recipients evaluate the feasibility of innovative energy research concepts. This grant program is intended to provide a simplified process for small businesses, small non-profits, academic institutions, and individuals that are impacted by the costs of applying to typical PIER solicitations. Funding such research efforts will encourage RD&D innovations that might otherwise not be successfully pursued. The maximum amount of any individual grant award will be \$75,000.

To achieve administrative efficiency for the Energy Innovations Small Grants program, the Energy Commission entered into a two-year, \$5 million Interagency Agreement with the California State University Institute during the fourth quarter of 1998. This Interagency Agreement delegates extensive administrative responsibilities for the program to the California State University system, but the Energy Commission retains full authority to review and approve individual grants. In addition, during the fourth quarter of 1998, preparation of the Small Grants application package was initiated. It is expected that actual project funding efforts will begin in the first quarter of 1999.

Electric Power Research Institute Membership

As a result of electricity deregulation, most electric utilities in California have eliminated their funding of public interest RD&D efforts, including their contributions to the Electric Power Research Institute (EPRI), which is located in Palo Alto, California. The EPRI is a leading national energy research organization, and the Energy Commission believes that providing PIER funding for certain EPRI memberships may help to ensure that California continues to receive the benefits of these nationally funded electricity RD&D efforts. This funding will also allow the Energy Commission to participate in guiding this RD&D.

During the fourth quarter of 1998, the Department of General Services gave final approval to the Energy Commission's one-year trial membership with EPRI. This one-year EPRI membership totals \$1.536 million and will fund seven public interest targets in energy efficiency, distributed generation, and system reliability. This membership will leverage \$12 million in matching funds from other EPRI members.

During the fourth quarter of 1998, the Energy Commission staff attended EPRI's second annual "Agricultural and Food Technology Alliance (AFTA)" meeting. This national meeting provides a forum to discuss the role of electric utilities in the agricultural and food processing industries as well as to advise EPRI on industry needs and opportunities that can be addressed by the membership. The committees that participated in the meeting presented their priority recommendations and identified the projects to be considered for funding in 1999. EPRI's next AFTA meeting will take place during the first week of May 1999.

Other Energy Commission-Funded Projects

During the fourth quarter of 1998, the Energy Commission also approved two separate energy RD&D funding awards with the University of California (UC Irvine – National Fuel Cell Research Center). The first award is for \$305,733 to fund a project entitled "Analyses and Technology Transfer for Fuel Cell Systems." This award will provide PIER funding support for further analyses and technology transfer of the fuel cell systems under development at the National Fuel Cell Research Center (NFCRC), which is located at the University of California, Irvine.

The second award, for \$210,000, comes from the Petroleum Violation Escrow Account (PVEA) and will fund a project "To Expand and Utilize the Capacity of the National Fuel Cell Research Center Program (Technology Transfer for Fuel Cell Systems)." The purpose of this Member Request Grant is to expand and utilize the capacity of the NFCRC programs, including technology transfer for fuel cell systems. This project benefits public interest energy research and demonstrates that such projects can be coordinated with other Energy Commission programs.

Designation of an Independent Panel for PIER Evaluation

Public Resources Code Section 25620.9(a) requires the Energy Commission, by January 1, 1999, to designate a panel of independent experts "to conduct a comprehensive evaluation of the PIER program" for submittal to the Governor and Legislature. The law further specifies that the panel must have "special expertise in public interest research, development and demonstration programs, and shall

evaluate the public value of the PIER program, including but not limited to (1) the monetary and non-monetary benefits to the public health and the environment, and (2) the benefits of those programs in providing funds for technology development that would otherwise not be funded.” The panel is required to submit its preliminary report to the Governor and the Legislature by March 31, 2000, and a final report including additional findings and recommendations is due by March 31, 2001.

In the fourth quarter of 1998, following extensive statewide and national contacts, the Energy Commission sought and obtained specific assistance and recommendations concerning panel selection from two outstanding California-based organizations, the California Council on Science and Technology (CCST) and the RAND Corporation. Both organizations have unique expertise in the selection of such panels and in the evaluation of public interest research programs. Based on this input and the recommendations of the RD&D Committee, the Energy Commission designated nine outstanding individuals to serve on the independent PIER Evaluation Panel at its Business Meeting on December 16, 1998. A list and summary description of the designated panel members is attached to this report. The panel is expected to hold its first meeting in February 1999.

PIER Program Planning Efforts

During the fourth quarter of 1998, the Energy Commission staff developed an initial draft of the energy-related RD&D program plans for future PIER funding in the following specific areas of:

(1) Industrial/Agriculture/Water end-use efficiency, (2) Building end-use efficiency, (3) Advanced Generation, (4) Renewable Generation, (5) Energy-Related Environmental Research, and (6) Strategic Energy Research. The Energy Commission’s RD&D Committee also actively sought input from its Policy Advisory Committee (PAC) of outside experts on the following issues: (1) refinements and targeting of PIER Program goals and objectives, (2) overall PIER Program planning and organization, and (3) PIER Program evaluation. The PAC has provided important comments for further planning and targeting the PIER Program, and will hold its next public meeting during the first quarter of 1999.

During the fourth quarter, the Energy Commission staff also began implementation of a Research Contract Management System (RCMS), an internet-based software tool designed to allow project managers to more efficiently track projects and contracts. The RCMS will enable the PIER Program to more effectively report on the status of ongoing work in the six subject areas and in the program as a whole. Staff plans to have the RCMS fully operational by the end of the first quarter in 1999.

Conclusion

The Energy Commission remains fully committed to administering the PIER Program in an efficient and effective manner that ensures public input and accountability. The PIER section of the Energy Commission’s Web Site can be accessed at <www.energy.ca.gov/research/PIER/index.html>, and is one of the most effective means of communicating with stakeholders and the public. Since the beginning of 1998, this section has received over 25,000 requests for downloading documents pertaining to the PIER Program. The Energy Commission staff also plans to have a PIER Program brochure available in Legislators’ offices in early 1999.

In summary, the Energy Commission continues to successfully develop and implement the PIER Program, in accordance with the directives contained in AB 1890 and SB 90. This summary completes the Energy Commission's Quarterly Report for the PIER Program for October 1 through December 31, 1998. Should you have questions or comments, please feel free to contact Traci Stevens, Director of Governmental Affairs at 654-4942.

DESIGNATED INDEPENDENT PIER EVALUATION PANEL MEMBERS

December 1998

Dr. Harold M. Agnew is an elected member of the National Academy of Science, the National Academy of Engineering, and a Fellow of the American Association for the Advancement of Sciences. He is a Past Director of Los Alamos Scientific Laboratory, and the retired President of General Atomics. He was Science Advisor to the Supreme Allied Commander in Europe 1961-64 and a New Mexico State Senator from 1955-61. Dr. Agnew's honors and awards include: recipient of the Ernest Orlando Lawrence award, 1966; and the Enrico Fermi award, 1978.

Dr. Richard E. Balzhiser served as the President and Chief Executive Officer of the Electric Power Research Institute (EPRI) in Palo Alto, California, until his retirement in 1996. He remains active in a President Emeritus role at EPRI, in addition to serving on several industry boards and technical advisory committees. Dr. Balzhiser currently serves a variety of boards and committees including the Energy Subcommittee of the President's Council of Advisors on Science and Technology, the Woods Hole Oceanographic Institution Advisory Board, the Pacific Northwest Laboratory Advisory Committee, and the Technical Advisory Board of the Massachusetts Institute of Technology Energy Laboratory.

Dr. Linda R. Cohen is Professor and Chair for the Department of Economics at the University of California, Irvine. Her fields of study are political economy, government regulation, government policy for science and technology, and positive political theory and law. Dr. Cohen has advised numerous federal departments and agencies on science policies, including the Departments of Energy and Commerce, the Office of Technology Assessment, and the Congressional Research Service, and has served on several committees for the National Research Council. She has testified before state agencies and commissions, including the California Energy Commission and the California Constitutional Reform Commission

Dr. John S. Foster Jr. is currently Chairman of the Board of Directors of Pilkington Aerospace, chairman of Technology Strategies and Alliances, and consultant to TRW, United Technologies Corporation, and the Defense Group, Inc. He has previously served as the Vice President of Science and Technology of TRW Inc. and as the former chairman of the Defense Science Board. His field of specialization is Industrial Manufacturing and Operating Systems Engineering, and he is recognized for his work in technological leadership in defense research and engineering. Dr. Foster was the director for the Lawrence Livermore National Laboratory from 1961 to 1965.

Dr. T. Kenneth Fowler has served as Professor of the Graduate School, University of California, Berkeley (now retired) where he helped to establish the multi-disciplinary Center for Nuclear and Toxic Waste Management. His honors and awards include elected membership in the National Academy of Sciences; Fusion Power Associates Distinguished Career Award, 1995; and The Berkeley Citation, 1995. Dr. Fowler's areas of interest include energy research funding and the appropriate role of government in anticipating problems of energy-associated pollution and energy-associated competition for resources in its research funding policies.

Peter M. Miller is a scientist with the Natural Resources Defense Council (NRDC), a nonprofit national environmental organization. He is part of NRDC's energy project, which promotes the increased development of energy efficiency and other environmentally sound and cost-effective energy resources. His work involves research, analysis, and advocacy at the state, national, and international levels. He has participated in utility advisory committees in California, Hawaii, and the Pacific Northwest, in numerous proceedings before the California Energy Commission, the California Public Utilities Commission and the Northwest Power Planning Council, and in rulemakings before the U.S. Department of Energy. He was appointed to the California Board for Energy Efficiency in April 1997.

Dr. James L. Sweeney is Professor and Chair for the Department of Engineering-Economic Systems and Operations Research, Stanford University. Dr. Sweeney has 25 plus years of experience working in energy and environmental economic issues, having worked at the federal level in the Federal Energy Administration in the 1970's, to a long history of research and analysis in energy economics and technology issues. Dr. Sweeney has had inputs into a number of National Energy Plans, is a member of the National Research Council, and has been president of the International Association for Energy Economics.

Dr. Mary L. Walshok is Associate Vice Chancellor - Extended Studies and Public Programs and Adjunct Professor in the Department of Sociology at the University of California, San Diego. She is the recipient of many awards and honors, among them a Kellogg Foundation national fellowship. Dr. Walshok serves on the board of the California Council for the Humanities and is a former member of Governor Wilson's Economic Strategies Panel. She also is a member of numerous community boards and professional associations including the San Diego Community Foundation, Girard Foundation, Eureka Communities, Foundation for Enterprise Development and ACCION.

Carl J. Weinberg is currently a private consultant, having retired from Pacific Gas and Electric Company (PG&E) where he worked for almost 20 years, including eight years as the Manager of PG&E's Research and Development Department. Mr. Weinberg has been a contributor to the development and implementation of corporate, industry, and national energy policies through research program management. He has extensive understanding of energy technologies, including commercial and potential renewable and conservation technologies, and has demonstrated effectiveness at accelerating technology readiness and proving technology benefits.

California Energy Commission - Public Interest Energy Research Program
Quarterly Report to the Legislature: October 1 - December 31, 1998

Overall Program Budget	
Authorized 1998/99 Fiscal Year Budget: \$61.8 million	Total Funds Encumbered as of December 31, 1998: \$28.7 million

RD&D Funding Efforts To Date	Accomplished October - December 1998	Planned January - March 1999
Transition Project Solicitation: Awarded \$17 million (over two fiscal years) for transitional support of 39 valuable, preexisting, RD&D projects. Covers all five SB 90 subject areas: 1) Renewables, 2) advanced generation, 3) environmental research, 4) buildings and 5) strategic energy research.	Transition Projects: Continued management of contracts involving transition projects. One contract was terminated, and 38 others are ongoing.	Transition Projects: Anticipate the completion of three to five transition projects during this period.
First General Solicitation: Awarded \$18.3 million for 20 public interest RD&D projects. Covers three SB 90 subject areas: Renewables, advanced generation, and environmental research.	First General Solicitation Projects: Finalized contracts and/or initiated actual work on 15 of the 20 projects.	First General Solicitation Projects: Work towards completion of remaining five contracts; three of the five should be completed by 3/31/99. Continue ongoing management of these 20 projects.
Second General Solicitation: Awarded \$13.6 million to 24 projects in competitive awards for two SB 90 subject areas: 1) end use efficiency and 2) strategic research.	Second General Solicitation Projects: Drafted contracts for the 24 projects involving awards totaling \$13.6 million.	Second General Solicitation Projects: Work towards completion and initiate work for the 24 projects involving awards totaling \$13.6 million. Expectation is for five contracts to be completed by 3/31/99.

**California Energy Commission - Public Interest Energy Research Program
Quarterly Report to the Legislature: July 1 - September 30, 1998**

(continued)

RD&D Funding Efforts To Date	Accomplished October - December 1998	Planned January - March 1999
Energy Innovations Small Grants Awarded \$5 million total, over two years, to assist in determining the feasibility of various innovative energy research ideas in the five PIER Program subject areas (individual grants may not exceed \$75,000).	Energy Innovations Small Grants Completed contract and initiated work on the Small Grant application package.	Energy Innovations Small Grants Grant application package is expected to be available during the first quarter of 1999.
EPRI Membership: Awarded approximately \$1.54 million for a one-year membership in certain RD&D programs conducted by EPRI. Leveraged \$15.4 million of matching funds from other EPRI members.	EPRI Membership: Sole source EPRI membership approved by the Energy Commission after 30-day review period of the Joint Legislative Budget Committee. Energy Commission personnel began participating in the guidance of specified EPRI research projects.	EPRI Membership: Participate in tailored energy research collaborations in the areas of agriculture, distributed resources, natural gas, and oil.